

Freshwater Advisories Recap 2021



Pamunkey Branch 8/30/21

Topics Overview

- Guidance for Cyanobacteria Advisory Management
- Freshwater HAB Investigation & Advisory Summary
- HAB Meetings & Other Efforts
- 2022 Programmatic Updates and Planning

Guidance for Recreational Cyanobacteria Advisory Management – Adopted Spring 2021

Advisory
Guidance
Adopted 2021

Applies to Recreational Advisories in Fresh and Brackish Waters – Planktonic blooms

Hybrid Advisory Approach:

- Cell counts \geq thresholds mean a higher probability of toxin production
- Either cell counts OR toxin conc. \geq thresholds issue an advisory; both needed < thresholds to lift advisory

Advisory Thresholds Adopted 2021:

<i>Microcystis</i> species	\geq	40,000cells/ml*
Total PTOX taxa	\geq	100,000cells/ml**
Microcystin	\geq	8ug/L*
Cylindrospermopsin	\geq	15ug/L*
Anatoxin-a	\geq	8ug/L
Saxitoxin	\geq	4ug/L

ug/L=ppb

= issue advisory

*EPA 2019 Revised Recreational HAB Advisory Recommendations
**WHO 2003 Recommendations

- Appendix B: List of regional potentially toxigenic (PTOX) cyanobacteria taxa based on literature reviews, other state plans, and discussions with regional partners.
- Anabaena
 - Anabaenopsis
 - Aphanizomenon
 - Chrysochloris
 - Cuspidothrix
 - Dolichospermum
 - Lyngbya
 - Microcystis
 - Microseira
 - Nodularia
 - Nostoc
 - Oscillatoria
 - Phormidium
 - Planktolyngbya
 - Planktothrix
 - Raphidiopsis
 - Sphaerospermopsis
 - Woronichinia
- Potentially Toxigenic = PTOX (taxa)
- The PTOX taxa list will be reviewed at least annually or more frequently as needed by HAB Task Force staff. References include: California 2017, D'Anglada et al. 2015, EPA 2019, GreenWater 2020, Ohio 2015, Oregon 2019, WHO 2003.



https://www.vdh.virginia.gov/content/uploads/sites/178/2022/01/FINAL_SIGNED_Guidance_for_Cyanobacteria_Recreational_Advisory_Mgt.5Aug2021-1.pdf

Advisories lifted: after 2 consecutive results below thresholds taken 10 days apart, both toxins and cell counts < thresholds; VDH may lift advisories with fewer results under certain circumstances

Freshwater HAB Advisory Summary

2021 FW Advisory Summary



3 Number of Virginia waterbodies that required advisories due to PTOX taxa > 100,000 cells/ml

Number of samples where cyanotoxins in water column analyzed were > 1µg/L **5**

Lake Anna (2), Aquia Ck (1), NF Shenandoah River (2)

Total water samples analyzed 2021 ~ 95

(<1% of all water samples contained toxins >1µg/L)

“Yellow” = Advisory
 Issued in abundance of caution for benthic mats

“Red” = Advisory
 Due to PTOX ≥ 100,000cells/ml

Waterbody Investigated	Months sampled (x)						Total # Days of Advisory
	May	June	July	Aug	Sept	Oct	
Aquia Creek - Widewater SP			x		x		87
NF Shenandoah River			x	x	x		70
Lake Anna	x	x	x	x	x	x	123
Pandapas Pond				x	x		24

★ AC
 ★ NFSR
 ★ LA
 ★ PP

Lake Anna Advisories

Investigation &
Advisory
Summary – Lake
Anna

2021 Recreational Advisory – **123** days

2020 Recreational Advisory – 92 days

2019 Recreational Advisory – 94 days

2018 Recreational Advisory – 76 days

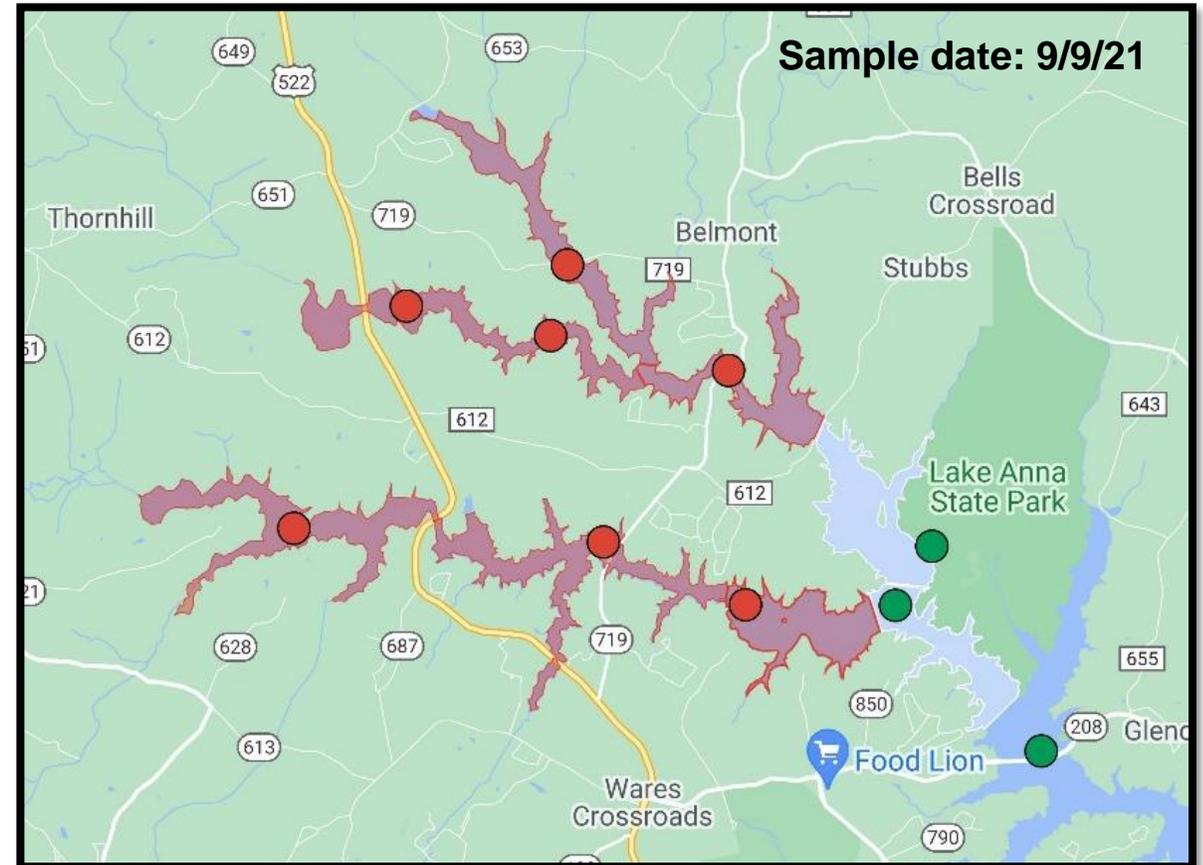
2017 Recreational Advisory – none

Worst extent of advisories:

- Advisory issued 9/17/21; Upper & Middle Pamunkey Branch, including Terry's Branch & Upper North Anna Branch from headwaters down to and extent we refer to as "Rose Valley Island"
- Advisory remained in place for 10/12 samples; could not lift the advisories before the end of the response season

NO advisories issued for the Lake Anna State Park shoreline site in 2020 or 2021

- 9/29/21 Triathlon organization results PTOX >100k cells/ml; no VDH advisory issued; "swim" race was not held at park – fell between 9/9 and 10/12 DEQ collections which were <100kcells/ml



North Fork Shenandoah River – Benthic Cyanobacteria

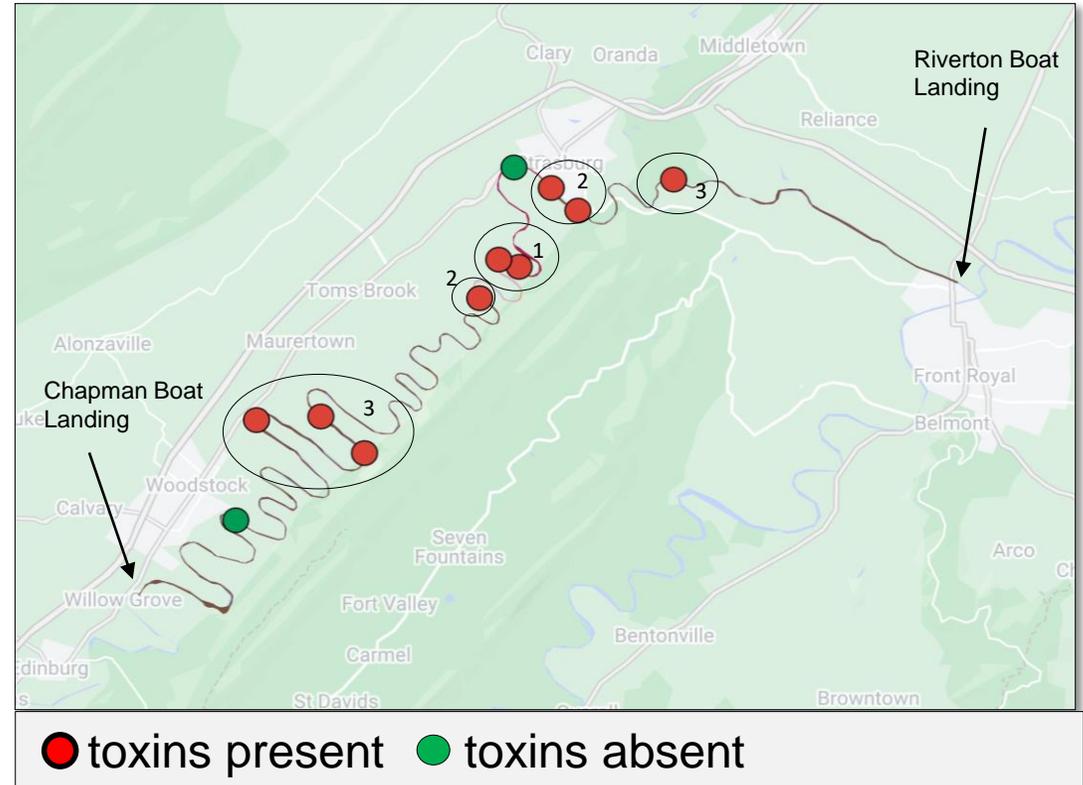
2021 Recreational Advisory – 70 days*

2020 Recreational Advisory – 0 days**

*advisory issued in abundance of caution due to presence of benthic mats at several locations

**no method for mat sample analysis in 2020

- (1) Bethel Road (vicinity) ~3mi
- (2) North River to Strasburg including Bethel Road ~8mi
- (3) Chapman Landing to Riverton ~53mi

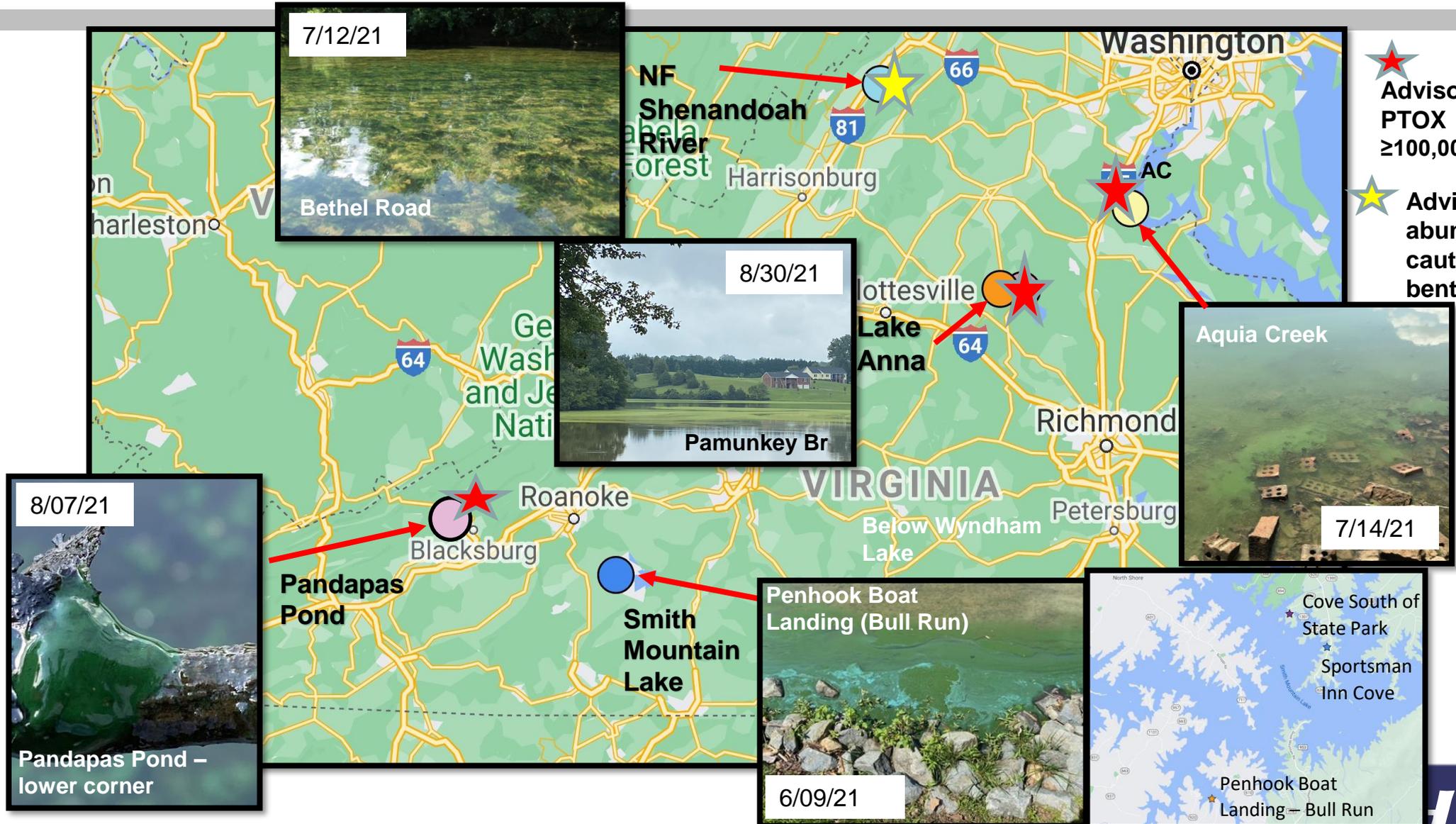


North Fork Shenandoah River - Bethel Rd
7/12/21 by DEQ – Benthic mats

NFSR Seven Bends State Park 7/7/21: by
Shenandoah Riverkeeper – filamentous
algae – no PTOX identified

2021 Other Freshwater Investigation Highlights

Investigation & Advisory Summary - "Other Highlights"



2021 Virginia HAB Task Force Meetings & Efforts

HAB Meetings & Efforts

Virginia Annual HAB Task Force Meeting January 2021

Virtually Hosted by VIMS

DEQ – LACA Stakeholder Partnership Meetings (3)

DEQ – Smith Mountain Lake Association & Local Health Partnership / Coordination Meetings (3)

NF Shenandoah River Event – (12+) of meetings with local, state, federal partners July - Sept

HAB Task Force Coordination Meetings VIMS/ODU/DEQ/VDH (10)

DEQ/VDH Report to General Assembly (~weekly meetings ahead of deadline)

“[RD411 - Harmful Algae Blooms in Virginia – September 2021](#)” → Figure 5 and 7 →

2022 GA HAB/FW Recreational Support Funding Proposal (*was not advanced*)

[Cyanobacteria Recreational Water Guidance](#) adopted – Spring 2021

Coordination of ODW Anatoxin-a and Saxitoxin threshold development (2)

CDC OHHABS Data – VDH internal process coordination

Private Lake Management/HOA Support and Guidance (4)

Lake Montclair (Prince William), Lake Wyndham (Henrico), Lake Louisa (Louisa), Fawn Lake (Spotsylvania), Green Mountain Lake (Greene)

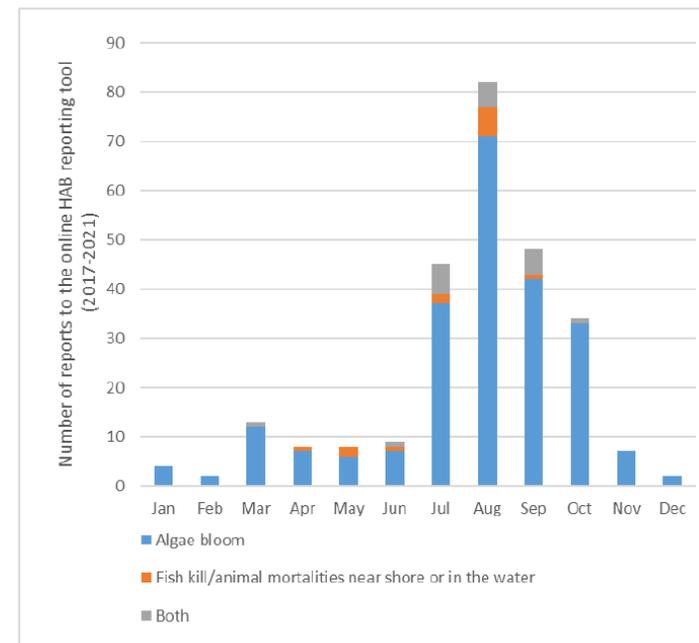


Figure 5. Potential HABs (or simply “Algal Blooms”) reported in each month (2017 - 2021). Laboratory analysis is necessary to confirm the presence of toxins or toxigenic species in harmful amounts.

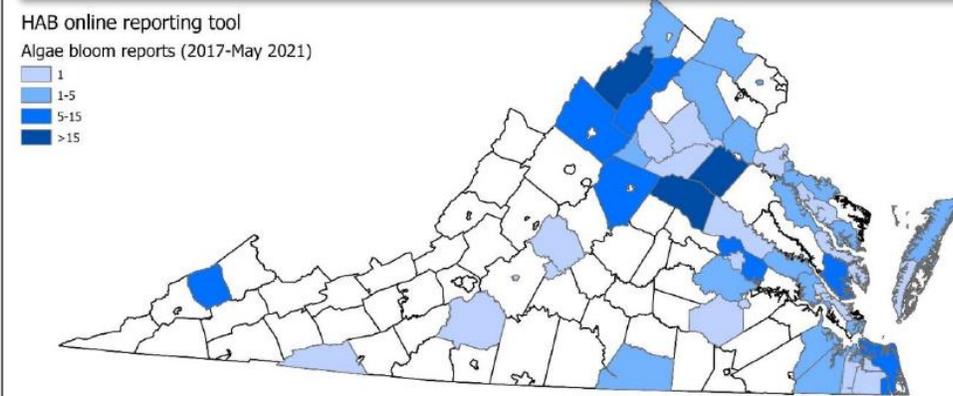


Figure 7. Map depicting the location and frequency of potential HAB reports in Virginia (2017-2021). Laboratory analysis is necessary to confirm the presence of toxins or toxigenic species in harmful amounts.

“General Assembly Report - [RD411 - Harmful Algae Blooms in Virginia – September 2021](#)”

2022 Job Aide for Benthic HABs to clarify 2021 Advisory Guidance

2022 Job Aide
for Benthic
CyanoHABs

- Bi-weekly meetings with DEQ staff to develop plans for response efforts related to benthic mats for the upcoming season
 - consensus to pause benthic mat collection/analysis in 2022
 - “job aide” development for benthic management which will complement existing advisory guidance for planktonic blooms ~ May/June
- Utilize Interstate Technology Regulatory Commission Benthic CyanoHAB guidance recommendations
- No additional funding expected support analysis of benthic mat material by external/commercial laboratories
- Exploring options:
 - methods for presence/absence of mats (visual ID)
 - water column samples/analysis supported at ODU (*collections dependent on field staff availability*)
 - potential for different “terminology” related to outreach for benthic HABs
 - consider alternative management strategies due to the challenges associated with benthic HABs
 - *other ideas - field test strips, SPATTs, cyanotoxin DNA assays, potential for cyanotoxin assays at VIMS, alternate methods for processing mats in ELISA assays*

2022 Programmatic Updates and Projects

Next Steps 2022

- VDH Job Aide for Benthic HABs – complement to existing advisory guidance (~May/June)
- Update Virginia HAB Response Plan (~May/June)
 - Current version - https://www.vdh.virginia.gov/content/uploads/sites/12/2018/05/Virginia_HAB_ResponsePlan_Final_2018.pdf
- Continued collaboration with partners:
 - MOU development between DEQ and VDH coordination of co-led response efforts
 - PPE for occupational exposure prevention – field and laboratory staff of VA HAB TF
 - Develop public health messaging for exposures to solids/mat material (*signs & brochures*)
 - Develop guidance for external partner data - *how VDH will use/not use HAB data collected/analyzed/submitted by external sources (non-profit and for-profit agencies)*
 - Develop a toolkit for private waterbody managers (*post online, ~May/June*)
 - Smith Mountain Lake and NF Shenandoah River – expand on coordination efforts for response and outreach with local staff and watershed organizations

Special thanks to members of the Virginia HAB Task Force and our local, state, and federal partners who have supported bloom response efforts this year!

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